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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/518,343	01/05/2005	Yves Fouillet	122001	5207
25944 7590 01/26/2010 OLIFF & BERRIDGE, PLC P.O. BOX 320850 ALEXANDRIA, VA 22320-4850				
EXAMINER LEVKOVICH, NATALIA A				
ART UNIT 1797		PAPER NUMBER		
NOTIFICATION DATE 01/26/2010		DELIVERY MODE ELECTRONIC		

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

OfficeAction25944@oliff.com  
jarnstrong@oliff.com

### Office Action Summary

**Application No.**

10/518,343

**Applicant(s)**

FOUILLET ET AL.

**Examiner**

NATALIA LEVKOVICH

**Art Unit**

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 29 October 2009.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 37-50 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37--50 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☐ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO/SB/C)
- 4) ☐ Interview Summary (PTO-413)
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_
- Paper No(s)/Mail Date \_\_\_\_\_

## **DETAILED ACTION**

### ***Continued Examination***

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114. Applicants submission filed on 10/29/2009 has been entered.

### ***Drawings***

2. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims, as well as any structural detail that is essential for a proper understanding of the disclosed invention. Therefore, the isolating chambers, as well as the two positions of the isolating chambers, as recited in claim 41, must be clearly shown *and referenced*, or the feature(s) canceled from the claim(s). No new matter should be entered.

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures

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appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. Each drawing sheet submitted after the filing date of an application must be labeled in the top margin as either "Replacement Sheet" or "New Sheet" pursuant to 37 CFR 1.121(d). If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance

***Claim Rejections - 35 USC § 112***

3. The following is a quotation of the first paragraph of 35 U.S.C. 112:

The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

4. Claims 41 and 50 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.

Claim 41 recites two isolating chambers, each configured for being 'in an open position that establishes communication between the respective one of the inlet duct and the outlet duct with an outside, and a closed position that isolates the respective one of the inlet duct and the outlet duct from the outside'. Based on the plain meaning of the term 'position' (i.e., 'a place occupied or to be occupied'], and upon further reviewing of the original written description, no support for this feature was found.

Claim 50 recites a magnet disposed downstream with respect to the heater. No support for this limitation was found in the original disclosure. The specification supports 'means 308 for retaining particles, for example of the magnetic type', the means can be 'placed downstream of the means 307 of dissociation (for example a heating means)'. The description of means 308 reads on magnetically actuated micro-valves. Nowhere the specification describes a magnet placed downstream of a heater.

5. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

6. Claim 37-50 are rejected under 35 U.S.C. 112, second paragraph, as being unclear for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The newly submitted independent claim 37 recites a heat exchanger 'that exchanges heat with one and/or the other gas trapping chamber to control a pressure of a gas in one and/or the other gas trapping chamber, wherein the pressure of the gas in the one and/or the other gas trapping chamber controls the

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flow of the liquid'. The 'liquid, lacks antecedent basis. Applicant is advised to identify and correct similar instances in other claims. Additionally, it is unclear how the control of the temperature and pressure can be accomplished in the absence of any pressure and/or temperature sensors, needed to provide a feedback information, such information being crucial for any controller. It is further unclear whether or not any logic device [controller] is intended. Thus, the claim is incomplete for omitting essential elements, such omission amounting to a gap between the elements. See MPEP § 2172.01.

With respect to claim 39, it is not clear from the language of the claim what structural features of the capillary valves would provide for generating the 'overpressure at a meniscus between the gas and the liquid, the overpressure substantially preventing displacement of the liquid beyond the capillary valve'.

Claim 40 recites each capillary valve comprising a base portion, 'wherein a cross section of the base portion widens in a direction of a concavity of the meniscus if the liquid is a wetting liquid, or the cross section of the base portion narrows in the direction of the concavity of the meniscus when the liquid is not wetting liquid'. This recitation renders the claim indefinite because the shape of meniscus in a capillary depends not only on the nature of a fluid, but also on the nature of the interior surface of the capillary, in particular, on hydrophobicity or hydrophilicity of the surface.

Claim 41 recites two isolating chambers, each configured for being 'in an open position that establishes communication between the respective one of the inlet duct and the outlet duct with an outside, and a closed position that isolates

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the respective one of the inlet duct and the outlet duct from the outside'. Based on the plain meaning of the term 'position' (that is, 'a place occupied or to be occupied'] and assuming that the chambers are not intended to be moved relative to other structural components, it is unclear whether or not the recitation means that each chamber must include a valve.

In claim 42, the recitation of the two 'another valves with no moving parts', is confusing. For clarity, the Office suggests to substitute these recitations with, for example, the 'third' and 'forth' valves.

In claim 44, it is not clear whether or not the capillary valves recited in lines 1 and 4, are the same as the first and second valves recited in claim 37 and/or the same as the two 'another valves' recited in claim 42.

### ***Claim Rejections - 35 USC § 102***

7. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(a) the invention was known or used by others in this country, or patented or described in a printed publication in this or a foreign country, before the invention thereof by the applicant for a patent.

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

8. Claims 37-50 are rejected under 35 U.S.C. 102(a) and (e) as anticipated by Mian (US 20010055812).

With respect to claims 37-48, Mian discloses micro-fluidic test devices comprising, as shown in Figure 26 and described in Example 9, inlet and outlet ducts communicating with an 'operative' cavity [not indexed; shown as the forth central cavity from the top] by means of respective valves. The 'operative' cavity further communicates with at least six other cavities with 'substantially identical' volume, namely, with two respective 'expansion' / 'isolating' chambers [shown as the third and the fifth central cavities from the top] and with two 'trapping' chambers connected to the corresponding ducts or / and to 'expansion' chambers via respective diagonal channels [connecting channels]. Any further central cavity can be used as an incubation chamber. Mian also teaches in paragraph [0150] that 'temperature control elements, particularly heating elements', can include 'heat lamps, direct laser heaters, Peltier heat pumps, resistive heaters ultrasonication heaters and microwave excitation heaters ['heat exchange devices that exchange heat'], which can be 'applied to the disk as a whole or in specific areas on the disk', including the 'trapping' chambers and/or inlet duct, depending on particular goals of testing.

Regarding claim 37- 40, it is also noted that the first and second valves 'with no moving parts' [ capillary valves], as well as the first and second connecting channels, are not positively recited as a part of the claimed invention, and, therefore, these components, including all their details (such as the base portion of the valves), are not accorded any patentable weight.



Regarding claim 47, Mian further teaches in [0312] that the cavities can comprise beads and / or magnetic particles covalently linked to DNA ['particles that form a support functionalized with ligand'].

As to claims 49- 50, Figure 26 shows micro-valves ['particle retaining devices'], arranged in contact with the inlet on every channel connecting each couple of adjacent cavities and configured for being actuated magnetically – (see paragraph [0220]). The micro-valve arranged at the outlet (the central valve shown in the bottom) would be downstream of a heater arranged at any other portion of the micro-fluidic circuit (see the discussion above).

### ***Response to Arguments***

9. Applicant's arguments of 10/29/2009 have been fully considered but they are not persuasive, or moot in view of the new grounds of rejection.

Applicant argues that, in Mian, the fluid movement is a 'result of rotation', in particular, 'Mian describes that the disk is rotated within the device to impart centripetal force to effect fluid flow on the disk' and that 'Mian describes that the amount of reagent delivered to a reaction chamber is controlled by the speed of rotation and time during which the valve to the reagent is open'.

Examiner notes that the instant claims do not recite any particular means for driving fluids and do not preclude rotating the fluidic circuit. The apparatus of Mean reads on the instant claims, since it has the structure comprising all limitations as recited.

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Applicant further argues that ]claim 37 requires a heat exchange device that exchanges heat with one and/or the other gas trapping chamber to control a pressure of a gas in one and/or the other gas trapping chamber wherein the pressure of the gas in the one and/or the other gas trapping chamber controls the flow of the liquid'] and that 'Mian does not describe in any way, a heat exchange device that exchanges heat with one and/or the other gas trapping chamber to control a pressure of a gas in one and/or the other gas trapping chamber wherein the pressure of the gas in the one and/or the other gas trapping chamber controls the flow of the liquid'.

Examiner disagrees. Mian does teach 'temperature control elements, particularly heating elements', that can include' heat lamps, direct laser heaters, Peltier heat pumps, resistive heaters ultrasonication heaters and microwave excitation heaters ['heat exchange devices' that inherently exchange heat]. The heaters can be 'applied to the disk as a whole or in specific areas on the disk', including the 'trapping' chambers and/or inlet duct, depending on particular goals of testing. Examiner also notes that any temperature changes in fluidic media are inevitably associated with pressure changes and impact ['control'] the fluid flow.

Applicant further argues that 'Mian describes that the temperature of any particular area on the disk can be monitored' and that 'the mere description that a temperature control element can be included in the device of Mian does not anticipate the heat exchange device that exchanges heat with one and/or the other gas trapping chamber to control a pressure of a gas in one and/or the other gas trapping chamber'. Examiner disagrees. In addition to monitoring the

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temperature (which is a mandatory step for any process of controlling), Mian teaches that 'temperature at *any* particular region of the disk can be regulated ['controlled'] by feedback control systems'. Examiner maintains that the heaters of Mian control the temperature through exchanging heat with the surroundings in the same fashion as the heaters recited in the instant claims.

### ***Conclusion***

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10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Natalia Levkovich whose telephone number is 571-272-2462.

The examiner can normally be reached on Mon-Fri, 2 p.m.-10 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jill Warden can be reached on 571-272-1267. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Natalia Levkovich/

Examiner, Art Unit 1797